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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/521,568	09/28/2005	Haruyuki Sato	0425-1171PUS1	4200
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BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER CORDRAY, DENNIS R	
			ART UNIT	PAPER NUMBER
			1731	
SHORTENED STATUTORY PERIOD OF RESPONSE		NOTIFICATION DATE	DELIVERY MODE	
3 MONTHS		01/22/2007	ELECTRONIC	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary

Application No.

10/521,568

Applicant(s)

SATO, HARUYUKI

Examiner

Dennis Cordray

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,6-14,16-20 and 22-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,6-14,16-20 and 22-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. By this Office Action, the finality of the previous Office Action is hereby vacated in view of newly discovered prior art and prosecution is reopened.
2. It is noted that the Office Action Summary in the previous Final Rejection incorrectly indicated that Claims 11, 15 and 19 were objected to. The correct listing should have been Claims 3, 15 and 24, as indicated in the body of the Office Action. Claims 11 and 19 were not objected to in the Office Action.
3. Applicant's amendments, filed 1/4/2007, with respect to the rejection of Claims 1-3, 6-10, 12-14, 16-18 and 20-24 under 35 U.S.C. 103(a) over Lin et al in view of Anderson et al have been fully considered and are persuasive. The rejection of has been withdrawn. Lin et al in view of Anderson et al recite in general the claimed composition, but do not recite of make obvious the improved ratio in burst index of -502 currently claimed. In addition, neither Lin et al or Anderson et al require a terpolymer as do the instant claims. Since the data provided in the examples in the instant Specification appear to show that specific terpolymers and surfactants are required to achieve the improved ratio in burst index of -502 or more, the disclosure of Lin et al does not anticipate or render obvious the instant invention. Since the significant amount of branching differentiates the disclosed polymer of Lin et al from those conventionally used in the art, it would not have been obvious to add a second water soluble polymer to the process of Lin et al.

However, upon further consideration, a new ground(s) of rejection is made as detailed below.

Claim Rejections - 35 USC § 103

4. Claims 1-2, 7-10, 12-14, 16-20 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (6417268) in view of Anderson et al (Re. 28474).

Zhang et al discloses a hydrophobically associative polymer used as a retention and drainage aid in papermaking (Abs; col 4, lines 29-32; col 14, line 52 to col 16, line 63). The preferred polymer is at least a terpolymer comprising at least (A) a C₈-C₂₀ alkyl ester or amide, (meth)acrylate esters being preferred monomers; (B) acrylic acid, methacrylic acid, and their salts; and (C) acrylamide or methacrylamide (col 5, lines 27-41; col 7, lines 46-53). The disclosed monomers are recited in the instant Specification on p 14, par 2, p 15, par 1 and p 16, par 2 for a nonionic unsaturated monomer having a solubility parameter of 20.5 or less (corresponds to monomer A), the anionic unsaturated monomer (corresponds to monomer B), and a nonionic unsaturated monomer having a solubility parameter of 26.6 or more (corresponds to monomer C). Monomer A is present in an amount up to 10 mole percent, B in an amount from 1 to 99.9 mole percent and C in an amount from 1 to 99.9 mole percent (col 6, lines 19-35). Cationic monomers are also permitted in the amount from 1 to 99.9 mole percent, and can comprise dialkylaminoalkyl (meth)acrylates or (meth)acrylamides (col 8, line 32 to col 9, line 25). The disclosed polymer composition thus significantly overlays the claimed polymer A.

Regarding Claims 16 and 17, the hydrophobic monomer of Zhang et al is present in an amount up to 10 molar percent of the terpolymer. Using 10 mole % C₁₀-alkyl acrylic acid ester for the hydrophobic monomer, 45 mole % sodium salt of methacrylic acid for the anionic monomer and 45 mole % acrylamide, the weight percent of the hydrophobic monomer is 20.6%. Thus, a significant number of embodiments of Zhang et al overlay the claimed compositions.

Zhang et al discloses a surfactant, which can be a salt of an alkyl sulfate, an ethoxylated alcohol or phenol, an ethylene oxide-propylene oxide copolymer, which are recited as examples in the instant Specification, p 22 (col 9, line 62-66; col 10, lines 7-12). The surfactant is present in an amount up to 10 weight percent and is dependent on the amount of hydrophobic monomer A used (col 10, lines 21-33). A preferred surfactant is sodium laurel sulfate, which is used in some of the examples of the instant invention, therefore possesses the claimed HLB. The surfactant can also be an ethoxylated phenol with 5-20 ethylene oxide units per molecule (col 10, lines 12-15).

Zhang et al discloses that the molecular weight of the polymer is from 10,000 to 10,000,000, which significantly overlays the claimed value.

Zhang et al does not disclose the ratio of copolymer A to surfactant B. Zhang et al does not recite the specific claimed species of surfactant. Zhang et al also does not disclose a paper made using the terpolymer or the improved properties in a paper.

Anderson et al discloses a method for inverting surfactants used for rapidly dissolving water soluble vinyl addition polymers in water (Abs). The emulsions can be used in papermaking processes (col 1, lines 12-18). The surfactants, which can be

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cationic or nonionic, are hydrophilic and water soluble (col 5, lines 10-13; and 29-30).

The surfactants are present in an amount of 0.01 to 50% based on the polymer, which significantly overlays the claimed polymer:surfactant ratio (col 5, lines 2-6).

The art of Zhang et al, Anderson et al and the instant invention is Zhang et al is analogous as pertaining to polymers added to papermaking processes. Zhang et al discloses that the amount of surfactant is dependent on the amount of hydrophobic monomer A that is used in the copolymer, while Anderson et al teaches that surfactants are present in an amount of 0.01 to 50% based on the polymer. It was within the capability of one of ordinary skill in the art at the time of the invention to determine the amount of surfactant needed through routine experimentation, thus obtaining the claimed ratio is considered by the Examiner to have been obvious to one of ordinary skill in the art over the disclosure of Zhang et al in view of Anderson et al. Making the mixture of polymer and surfactant water soluble would have been obvious to facilitate addition to the aqueous papermaking suspension. Addition of the composition prior to forming the paper would further have been obvious as a typical point of addition of retention aids. The claimed papermaking speed is typical, as discussed in a previous Office Action. Making a paper would also have been obvious.

Regarding the surfactant, Zhang et al recites ethoxylated alcohols and ethoxylated phenols having 5-20 ethylene oxide units per molecule. It would have been obvious to one of ordinary skill in the art to use an ethoxylated C₂-C₄ alcohol having 5-20 ethylene oxide units per molecule as a functionally equivalent option.

The terpolymers of Zhang et al will inherently provide, or at least it would have been obvious to one of ordinary skill in the art to obtain, the claimed property improvements in paper because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent. In the instant case, the terpolymer and surfactant composition are substantially identical to the claimed composition.

5. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al in view of Honig et al (5167766).

Zhang et al does not disclose a crosslinking monomer.

Honig et al discloses a drainage and retention system used in papermaking comprising crosslinked or uncrosslinked organic microbeads and a high molecular weight polymer and/or polysaccharide (Abstract). As discussed in a previous Office Action, the microbeads of Honig et al are formed from nonionic and anionic and/or cationic monomers recited in the instant Specification. The nonionic, anionic and/or cationic monomers are present in the claimed ranges. Honig et al discloses that polyfunctional crosslinking agents, which include N,N-methylenebis(meth)acrylamide, polyethyleneglycol diacrylate, divinylbenzene (recited on p 16 of the instant Specification) are also present, in embodiments where crosslinking occurs, in an

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amount of from 4 to 6000 molar ppm (col 6, lines 36-47 and 55-62). Honig et al discloses the use of a surfactant having an HLB value from 8 to about 11 (col 7, lines 59-61).

Honig et al discloses that using a high molecular weight (100,000 to 25,000,000) synthetic polymer and cationic starch with anionic microbeads greatly improves drainage (col 8, lines 23-26; col 13, lines 45-47). The anionic microbeads and high molecular weight polymer are each used in an amount from 0.05 to 20 lb/ton (col 3, lines 15-22).

The art of Zhang et al, Honig et al and the instant invention is analogous as pertaining to polymers added to papermaking processes before the papermaking step. Since Honig et al discloses that either crosslinked or uncrosslinked polymers can be used, it would have been obvious to one of ordinary skill in the art to add the claimed crosslinking monomers to the composition of Zhang et al in view of Honig et al as a functionally equivalent option. It would further have been obvious to add the claimed polymer C to enhance drainage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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